

**PREVALENCE OF SELECTED BACTERIAL AND VIRAL ENTERO-  
PATHOGENS IN CHILDREN LESS THAN 5 YEARS OF AGE IN  
LIMPOPO PROVINCE, SOUTH AFRICA**

by

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## ABSTRACT

# PREVALENCE OF SELECTED BACTERIAL AND VIRAL ENTERO-PATHOGENS IN CHILDREN LESS THAN 5 YEARS OF AGE IN LIMPOPO PROVINCE, SOUTH AFRICA

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**Background:** Enteric pathogen infections in young children less than 5 years of age are a serious health risk which leads to mortality and morbidity in several countries.

**Objectives:** The aim of this study was to determine the prevalence of selected bacterial (Diarrheagenic *Escherichia coli*, *Shigella* spp. and *Salmonella* spp.) and viral (Adenovirus 40/41, Norovirus and Rotavirus) pathogens in children from rural communities suffering from diarrhea in Limpopo province of South Africa.

**Method:** A cross-sectional study was conducted from July 2014 to May 2015. A total of 237 stool specimen of children less than 5 years of age presenting with diarrhea were collected from Primary Health Care facilities in various rural communities of the Vhembe district in Limpopo province, South Africa. Bacterial DNA from stool samples were extracted using QIAamp fast DNA stool mini kit; published m-PCR protocol was used to detect *E. coli*, *Shigella* spp. and *Salmonella* spp. Two different conformational m-PCR protocols were used to detect Diarrheagenic *E. coli* and another to detect *S. typhimurium*, *S. enteritidis*, *S. dysenteriae* and *Shigella* spp. Rotavirus Group A, Norovirus and adenovirus 40/41 were detected using a commercially available Enzyme Immune Assay (EIA) protocols.

**Results:** Diarrheal pathogens were detected in 62.4% of the 237 participants. The following pathogens were detected ETEC (30.8%), EAEC (26.2%), EIEC (7.6%), atypical EPEC (15.6%), typical EPEC (20.7%), EHEC (0.8%), *S. flexineri* (4.2%), *Shigella* spp., (1.3%), *S. enteritidis* (1.3%) and *S. typhimurium* (0.4%), Rotavirus (10.1%), Norovirus (8.7%), Adenovirus 40/41 (7.6%). Bacteria and bacteria co-

infections were more prevalent (26.2%). More male participants were infected with an enteric pathogen than females (51.1% vs 43.7%). Most of the enteric pathogens were detected in children less than 2 years of age (56%). Although no clear seasonal pattern was established; bacterial infections were observed throughout the year and enteric viruses were detected in dry cooler months.

**Conclusion:** The findings of this study clearly revealed that enteric pathogens are etiological agents of diarrhea in children less than 5 years of age in the Vhembe district. The high detection rates of DEC and other enteric pathogens clearly indicate the need to improve sanitation and hygiene in these rural communities of Limpopo province, South Africa. Continuous epidemiological studies must be done to determine the infection and health risks of enteric pathogens.

Key words: Diarrhea, enteric pathogens, Limpopo province, Adenovirus 40/41, Rotavirus, Norovirus, Diarrheagenic *E. coli*, *S. enteritidis*, *S. typhimurium*, *S. flexneri*, *Shigella* spp.